SLOVENSKI STANDARD
SIST EN 16102:2012

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Inteligentni transportni sistemi - Elektronski klic v sili - Operativne zahteve za podporo tretje stranke

Intelligent transport systems - ECall - Operating requirements for third party support

Intelligente Verkehrssysteme - ECall - Betriebsanforderungen für den TPS eCall

Systèmes de transport intelligents - ECall - Exigences opérationnelles des services eCall de fournisseurs privés

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13.200	Preprečevanje nesreč in katastrof	Accident and disaster control
35.240.60	Uporabniške rešitve IT v transportu in trgovini	IT applications in transport and trade
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Intelligent transport systems - eCall - Operating requirements for third party support

Systèmes de transport intelligents - eCall - Exigences opérationnelles des services eCall de fournisseurs privés

Intelligente Verkehrssysteme - Notruf - Betriebsanforderungen für die Notruf-Unterstützung durch Dritte

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Foreword

This document (EN 16102:2011) has been prepared by Technical Committee CEN/TC “Road transport and traffic telematics”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2012, and conflicting national standards shall be withdrawn at the latest by June 2012.

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Introduction

The scale of death and injury on roads in Europe needs to be fully comprehended to understand the need for an automated method to alert about accidents. In 2008, there were 38 900 fatalities in the EU-27. The figure for 2009 is around 34 500 fatalities. The trend for 2001 to 2008 is around a 5 % annual reduction. Road accident Injuries are in the region of 1,7 million (2008). An automated method of accident notification has been estimated to have the potential to save up to 2 500 fatalities annually in the EU-27 when fully deployed, and reduce the severity of injuries in order to bring significant savings to society in terms of reduced costs and human suffering.

Emergency calls made from vehicles can assist with the objectives of significantly reducing road deaths and injuries, but drivers often have poor (imprecise) location awareness, especially on interurban roads or abroad. Additionally, in many situations, the car occupants may not be in a position to call using a normal mobile phone.

The situation is worse for those travelling abroad: a high (and increasing) number of vehicles travelling outside their home country and this is therefore also contributing to the need for an automated emergency call system in vehicles. In the EU there are over 100 million trips to another EU country per year (EU-15). 65 % of people feel less protected while abroad and most do not know which number to call in an emergency (in some countries over 60 %). Language problems are pertinent and may render communication difficult.

In the most crucial cases, the victim(s) may not be able to call because they have been injured and/or trapped, do not know the local number to call, and in many cases, particularly in rural situations and late at night, there may be no witnesses who happen to have a mobile phone or a sense of community.

The objective of implementing an in-vehicle emergency call system is to automate the notification of a traffic accident. One major benefit is to transmit *data* from the vehicle.

There are two means to provide an *eCall* from a vehicle:

— One method is to use the *pan-European eCall*, which sends the voice call and the *data* directly to the PSAP, using the emergency number 112.

— Another method consists of using a ‘third party services supported eCall’, referred to as *TPS-eCall* in this document. This is an *eCall* variant which includes the transmission of *data* to a Third Party Service Provider or TPSP, and the establishment of a voice call with this TPSP. In the case of an emergency likely to require assistance from the emergency services, the TPSP establishes a voice connection with the *most appropriate PSAP*. The TPSP also forwards all relevant information concerning the event, including the information specified as mandatory by the MSD standard (EN 15722) as a minimum, to the *most appropriate PSAP*. The TPSP also provides voice communication between the PSAP and the *vehicle occupants* by setting up a conference call for example, if this is required by any of the parties involved and allowed by the PSAP.

This European Standard specifies the generic operational requirements for the *TPS-eCall*.

1 Scope

The objective of implementing a 'Third Party' emergency call is to provide emergency assistance and an automated notification of a traffic accident, using 'Third Party Services' packages where such services are supported between the vehicle and a Third Party Service Provider in countries where such notification of an emergency are supported by PSAPs.

The first objective of this *TPS-eCall* is to transfer an emergency message from a vehicle to a Third Party Service Provider (TPSP) in the event of a crash or an emergency, and to establish a voice channel between the in-vehicle equipment and the TPSP.

The second objective of this *TPS-eCall* is, in case of an emergency likely to require assistance from the emergency services, for the TPSP to transfer an emergency message including the *data* of the *Minimum Set of Data* (MSD) (as defined in EN 15722) from the TPSP to the *most appropriate PSAP* and to make best efforts to establish a direct voice contact between that PSAP and the occupants of the vehicle if required by the PSAP.

This European Standard specifies the general operating requirements and intrinsic procedures for an in-vehicle *eCall* via the services of a Third Party Service Provider (TPSP).

This European Standard also provides definition of the service(s) provided to the PSAP and the method and form of service delivery.

NOTE An important part of the *TPS-eCall* is the *Minimum Set of Data* (MSD). The operating requirements for the MSD are determined in this European Standard, but the form and *data* content of the MSD is not defined herein. The common European MSD for *eCall* is determined in EN 15722. Additional *data concepts* may also be transferred, and it is recommended that any such *data* concepts be registered using a *data registry* as defined in EN ISO 24978 to ensure that they can be understood by the recipient.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15722:2011, *Intelligent transport systems — eSafety — eCall minimum set of data (MSD)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
112
single European emergency call number

3.2
data
representations of static or dynamic objects in a formalized manner suitable for communication, interpretation, or processing by humans or by machines

3.3
data concept
any of a group of data structures (i.e. object class, property, value domain, *data elements*, message, interface dialogue, *association*) referring to abstractions or things in the natural world that can be identified with explicit boundaries and meaning and whose properties and behaviour all follow the same rules

3.4
data dictionary
organized and constructed (electronic database) compilation of descriptions of *data concepts* that provides a consistent means for documenting, storing and retrieving the syntactical form (i.e. representational form) and the meaning and connotation of *eCall data concept*

NOTE A *data registry* provides definition of the metadata concept, it does not store the values of individual instances. For example, a *data registry* with a *data concept* 'registration plate identification of a vehicle' defines how the identification numbers/letters are represented. It does not contain a list of particular licence plates.

3.5
data element
single unit of information of interest (such as a fact, proposition, observation, etc.) about some (entity) class of interest (e.g. a person, place, process, property, concept, *association*, state, event) considered to be indivisible in a particular context

3.6
data registry
registration process to store *data* definitions, characterized in a consistent manner, as determined according to the provisions of an international standard, in a *data dictionary*

NOTE Neither a *data registry* nor a *data dictionary* provides a database of specific values of instances of the use of the registry/dictionary in an implementation.

3.7
E164
ITU-T recommendation which defines the international public telecommunication numbering plan used in the PSTN and some other *data* networks

3.8
eCall

emergency call generated either automatically via activation of in-vehicle sensors or manually by the *vehicle occupants*; when activated, it provides notification and relevant location information to the most appropriate *Public Safety Answering Point*, by means of 'mobile wireless communications networks', carries a defined standardised *Minimum Set of Data*, notifying that there has been an incident that requires response from the emergency services and establishes an audio channel between the occupants of the vehicle and the *most appropriate Public Safety Answering Point*

[EN 16072:2011]

3.9
IVS dataset
minimum set of vehicle-generated *data elements* which are essential for the performance of the *TPS-eCall*

NOTE 1 The format and content of this 'IVS dataset' is not defined by this European Standard, but it needs to be possible for the service provider to create an MSD as defined in EN 15722 based on this 'IVS dataset'.

NOTE 2 This may be a sub-set of the MSD *data elements* as some MSD elements can be inferred/looked-up from other elements by the TPSP.

3.10
Minimum Set of Data (MSD)
standardised *data concept*, comprising *data elements* essential for the notification of a *TPS-eCall* to a PSAP

[EN 15722:2011]

3.11
Network Access Device (NAD)
see *mobile wireless communications network device*

3.12
pan-European eCall
eCall provided by a 'Teleservice 12' mobile communication network, as defined in EN 16072

3.13
Public Safety Answering Point (PSAP)
physical location where emergency calls are first received under the responsibility of a public authority or a private organisation recognised by the government (see also *most appropriate PSAP*)

NOTE A number of different instantiations of PSAP service are supported within this European Standard.

3.14
most appropriate PSAP
PSAP defined beforehand by national authorities to cover emergency calls from a certain area or for emergency calls of a certain type (see also PSAP).

NOTE A number of different instantiations of PSAP service are supported within this European Standard. A PSAP may be a Public Authority or a private service provider operating under the control of a Public Authority.

3.15
PSAP emergency telephone number

telephone number, generally conformant with the E164 general numbering scheme, which a TPSP can dial internationally in order to establish a voice connection to the PSAP as part of a *TPS-eCall notification*

3.16
PSAP emergency TSD-push address
secure URL provided by a PSAP, which allows an approved *TPS-eCall notifier* to push a *TPS-eCall set of data*, including a *TPS-eCall unique reference identification*, to this PSAP, using methods standardised in this European Standard

3.17
TPS-eCall set of data (TSD)
dataset in a format standardised within this European Standard, which can be used by a TPSP acting as a *TPS-eCall notifier* to forward details of a *TPS-eCall* to a PSAP

3.18
TPS-eCall generator
occupant of a vehicle or equipment within a vehicle that has cause to trigger a *TPS-eCall transaction* by automatic or manual means

3.19
TPS-eCall responder
organisation specifically trained for managing assistance or emergencies, which receives a *TPS-eCall* and notifies the vehicle or caller that the call has been received

NOTE The *TPS-eCall responder* and *TPS-eCall notifier* will often be the same organisation but, to clarify the separate stages involved in a *TPS-eCall*, distinct roles and definitions are used in this European Standard. Within the *TPS-eCall responder* different organisations can handle the voice connection and the *data* management of an *eCall* event.

3.20
TPS-eCall notification
notification from a *TPS-eCall notifier* to a *most appropriate PSAP* about a *TPS-eCall* likely to require assistance from the emergency services, and provision of all relevant information concerning the event (if necessary collating *data* from the 'IVS dataset' and *data* from other sources), including the information specified as mandatory by the MSD standard EN 15722 as a minimum

3.21
TPS-eCall notifier
organisation specifically trained for managing emergencies, which performs a *TPS-eCall notification*; as a consequence of a *TPS-eCall responder* receiving a *TPS-eCall* likely to require assistance from the emergency services

NOTE 1 The *TPS-eCall notifier* also makes best efforts to provide voice communication between the PSAP and the *vehicle occupants*, at least by setting up a conference call, if this is required by any of the parties involved.

NOTE 2 The *TPS-eCall responder* and *TPS-eCall notifier* will often be the same organisation but, to clarify the separate stages involved, distinct roles and definitions are used in this standard for each stage of the *TPS-eCall*. Within the *TPS-eCall responder,* different organisations can handle the voice connection and the *data* management of an *eCall* event.

3.22
TPS-eCall service
capability of a vehicle to be a *TPS-eCall generator*, triggering of a *TPS-eCall transaction*, intent of a TPSP to be a *TPS-eCall responder* and provision of that response including where necessary a *TPS-eCall notification*

3.23
TPS-eCall transaction
transmission across a mobile network of a set of *data* from a vehicle to a *TPS-eCall responder* and the establishment of a voice channel between the vehicle and the *TPS-eCall responder*

3.24
TPS-eCall
'third party services supported eCall': *eCall* variant as described and defined in this European Standard

NOTE In summary, it includes the transmission of the 'IVS dataset' (plus possibly additional *data*) from the vehicle to a TPSP, and the establishment of a voice call with this TPSP. In the event of an emergency likely to require assistance from the emergency services, the TPSP establishes a voice connection with the *most appropriate PSAP*. The TPSP also forwards all relevant information concerning the event, including the information specified as mandatory by the MSD standard (EN 15722) as a minimum, to this *most appropriate PSAP*. The TPSP also provides voice communication between the PSAP and the *vehicle occupants*, at least by setting up a conference call, if this is required by any of the parties involved.

3.25
TPS in-vehicle equipment
equipment within the vehicle that provides or has access to in-vehicle *data* required for the 'IVS dataset' to effect the *TPS-eCall transaction* via a public mobile wireless communications network providing a link between the vehicle and a *TPS-eCall responder*

3.26
TPS in-vehicle equipment provider
provider of *TPS in-vehicle equipment*

NOTE The *TPS in-vehicle equipment provider* may be the *vehicle manufacturer* or the provider of aftermarket equipment.

3.27
TPS in-vehicle system (TPS-IVS)
TPS in-vehicle equipment together with the means to trigger, manage and effect the *TPS-eCall transaction*

3.28
TPS In-Vehicle System provider
provider of a *TPS In-Vehicle System*

NOTE The *TPS In-Vehicle System provider* may be the *vehicle manufacturer* or the provider of aftermarket equipment.

3.29
TPSP
Third Party Service Provider organisation, recognised by the national rescue authorities as being allowed to transmit *TPS-eCall* to them, and compliant with the requirements of this standard

NOTE The TPSP has two roles; *TPS-eCall responder* and *TPS-eCall notifier*.

3.30
TPSPCallbackNumber
telephone number of a prioritised voice contact at the TPSP call centre which can be used by the PSAP in case a subsequent call-back is required to request more details about the emergency or even to speak to *vehicle occupants*

3.31
TPS-eCall unique reference identification (TPS-eCall-UID)
unique standardised reference identification assigned by the TPSP to a given *TPS-eCall*

3.32
TPS-eCall short reference identification (TPS-eCall-SID)
shortened form of the *TPS-eCall-UID*, which is restricted to current and recent incidents, designed to be appropriate for forwarding verbally to a PSAP operator, to allow less-equipped PSAPs to refer to a specific *TPS-eCall set of data* for a current or recent incident

3.33
vehicle manufacturer
entity which first assembles the vehicle and may provide a 'TPS in-vehicle system' as part of its specification and subsequently sells the vehicle directly or via an agent

3.34
vehicle occupant(s)
person(s) inside the vehicle

3.35
VehiclePhoneNumber
telephone number of the *TPS In-Vehicle System* which may be used to attempt a call back to the vehicle

4 Symbols and abbreviated terms

ACD	Automatic Call Distribution
CLI	Caller Line Identifier
GIS	Geographic Information System
GNSS	Global Navigation Satellite System
GSM	Global System for Mobile communications
HMI	Human Machine Interface
TPS-IVS	*TPS In-Vehicle System*

MSD *Minimum Set of Data*

MNO Mobile Network Operator

NAD *Network Access Device* (e.g. a GSM or UMTS module)

PSAP *Public Safety Answering Point*

SID Session Identification

TPS Third Party Services

TPSP Third Party Service Provider

TSD *TPS-eCall set of data*

5 High level functional requirements

5.1 General high level functional requirements

The high level functional requirements of the *TPS-eCall* service are as follows:

— in the event of an accident, the *TPS-IVS* shall automatically determine whether or not to trigger a *TPS-eCall* and, when appropriate, make such a call automatically;

— a *TPS-eCall* shall also be able to be triggered manually;

— the TPS In-Vehicle System shall include an integrated Network Access Device (NAD), e.g. a GSM module (including a valid and activated SIM Card) and a GNSS system. Upon triggering a *TPS-eCall*, as defined in 8.2, the *TPS-IVS* shall attempt to send an IVS dataset to the relevant *TPS-eCall responder*;

NOTE 1 If some *data elements* can be accurately inferred by the TPSP (e.g. vehicle type based on a VIN), these elements may not necessarily be sent from the vehicle. Additional information may be provided by the TPSP.

— in countries for which the necessary organisation has been set up, a Third Party Service Provider shall act as a *TPS-eCall responder* to receive and respond to a *TPS-eCall transaction* from the vehicle, including determining whether or not there is a need to notify the *most appropriate PSAP* about the incident;

— in case of an emergency likely to require assistance from the emergency services, a TPSP:

  — shall act as a *TPS-eCall notifier* to request such assistance from the *most appropriate PSAP*; to provide the *most appropriate PSAP* with all relevant information (as determined in this European Standard);

  — shall make best efforts to establish a voice connection initially between the vehicle and the relevant TPSP and subsequently shall make best efforts to make a direct voice connection between the occupants of the vehicle and the PSAP if this is required by the PSAP (see also 5.3);

NOTE 2 Additional information may be provided to the PSAP.

— the TPSP shall be able to attempt to re-establish the voice communication with the vehicle as long as the *VehiclePhoneNumber* is known.

NOTE 3 Although normally available, due to the nature of the mobile networks, it cannot be 100 % technically guaranteed that the *VehiclePhoneNumber* is known in all cases.

5.2 TPS-eCall generic architecture

A very high level generic architecture for *TPS-eCall* is described in Figure 1.

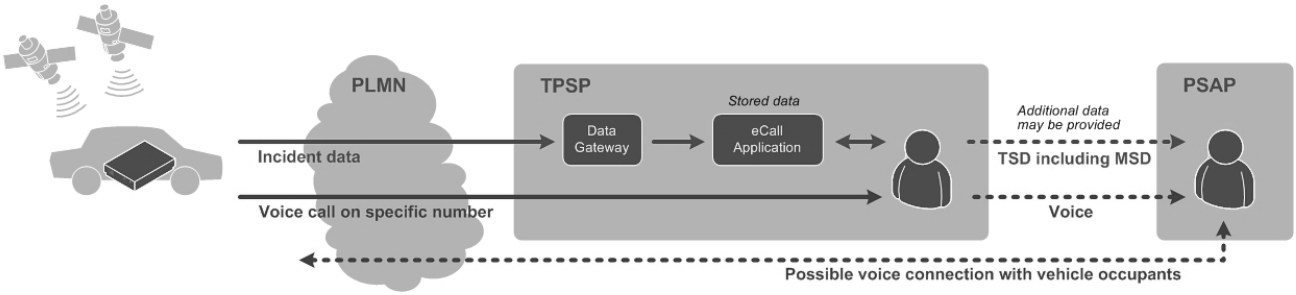

Figure 1 — *TPS-eCall* system overview

The relationship between the *TPS-eCall* and the *pan-European eCall* is shown in Figure 2 below:

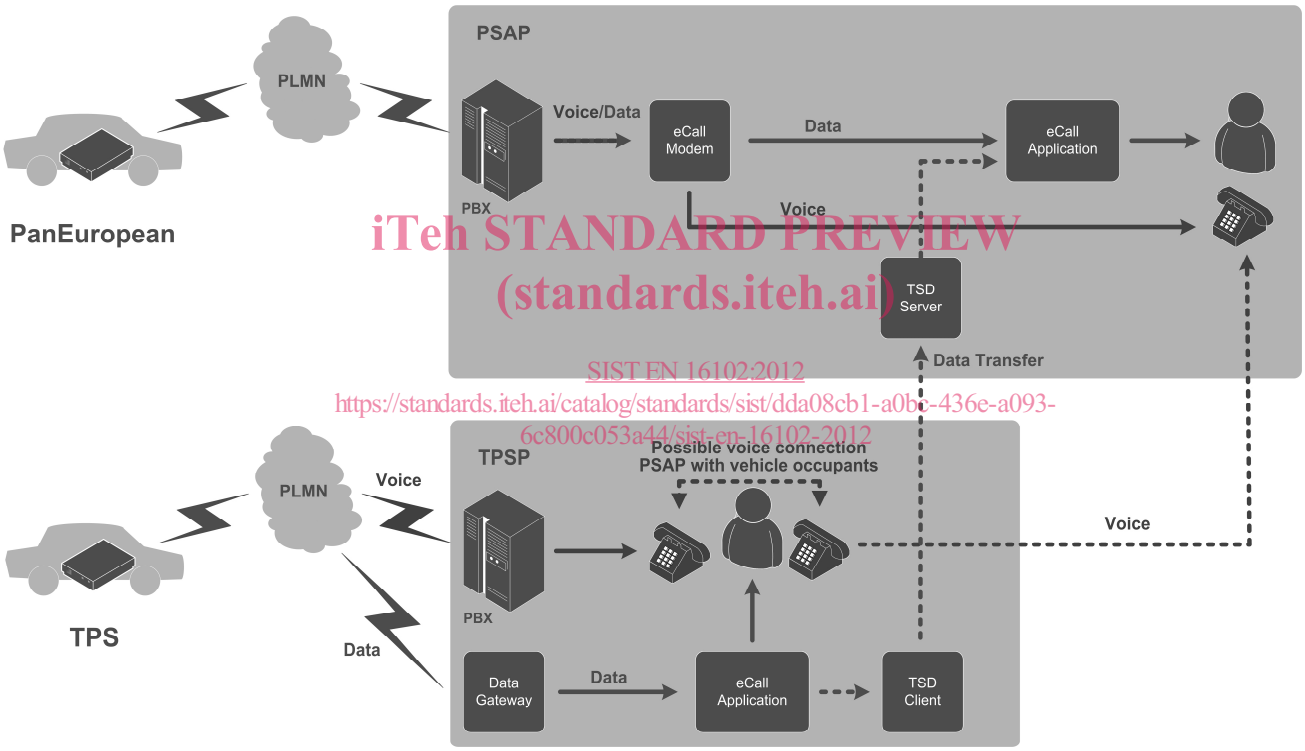

Figure 2 — End-to-end *pan-European eCall* and *TPS-eCall* systems connected to an eCall enabled PSAP

5.3 TPS-eCall operation sequence

The generic *TPS-eCall* functional operational sequence is as follows:

The *TPS-eCall generator* initiates the *TPS-eCall* by whatever means (such as sensors/vehicle-processors) automatically triggered and/or manually triggered. The *TPS-eCall* (between car and TPSP) consists of two elements:

— the data ('IVS dataset') provided by the *TPS-IVS*;

— a voice (audio) call between the TPSP and the occupants of the vehicle.

The Mobile Network Operator (MNO) shall treat the *TPS-eCall* as any other call and shall include the Caller Line Identifier (CLI).

The MNO shall establish the E164 call and transmit the *data* to the appropriate TPSP, according to the relevant subscriber service level agreement.

It shall be possible to verify whether the *data* has been properly received and a mechanism shall be provided in order to retransmit the *data* if necessary.

In case of an emergency likely to require assistance from the emergency services, the TPSP shall then send all necessary information including at least the mandatory *data* from the MSD (if necessary collating *data* from the 'IVS dataset' and *data* from other sources) to the *most appropriate PSAP* using the supported interface for *data* transmission to this PSAP, e.g. the PSAP interface contained in this standard, and the TPSP shall make best efforts to establish an audio/voice link between the PSAP and the occupants of the vehicle, if this is required by the PSAP.

5.4 Privacy aspects

All stakeholders involved are obliged to comply with all EU directives related to the protection of *data* and the privacy of the citizens.

This does not prevent the Third Party Services package providers to offer, at their discretion, any supplementary service, provided they respect EU regulations concerning privacy.

NOTE At the time of developing the standard the European Directives 95/46 and 2002/58 apply.

6 Transmission from vehicle aspects

6.1 General requirements for the transmission from vehicle

Regardless of the wireless and wired transmission technologies employed in the provision of *TPS-eCall*, the 'TPS-eCall system provider' shall at all times ensure that they employ a reliable means of transmission in respect of

— the *data* transmission from the vehicle to the TPSP,

— the MSD transmission from the TPSP to the PSAP, and

— where required by the PSAP, in respect of the establishment of a voice connection between the PSAP and the occupants of the vehicle.

The *TPS-IVS* shall implement adequate systems in order to ensure that the 'IVS dataset' is reliably sent and will be reliably received by the *TPS-eCall responder*.

The *TPS In-Vehicle System provider* shall show that the transmission of *data* from the vehicle to the TPSP shall be successful with at least 95 % success rate in less than 20 seconds from an area where the mobile radio strength indicator of a network supported by the *TPS-IVS* (RSSI as defined in ETSI standards) is better than -99 dBm, including multiple attempts if necessary.

The *TPS In-Vehicle System provider* shall show that the establishment of a direct voice connection between the occupants of the vehicle and the *TPS-eCall responder*, shall be successful with at least 95 % success rate from an area where the mobile radio strength indicator is better than -99 dBm, including multiple attempts if necessary.

NOTE 1 Transmission time may be dependent on the chosen technology.

NOTE 2 The RSSI figures will be different for networks other than GSM.